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PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-046901
(43)Date of publication of application : 16.02.1996

(51)Int.Cl. H04N 5/76
H04N 5/92
H04N 7/24

(21)Application number : 06-175383
(22)Date of filing : 27.07.1994

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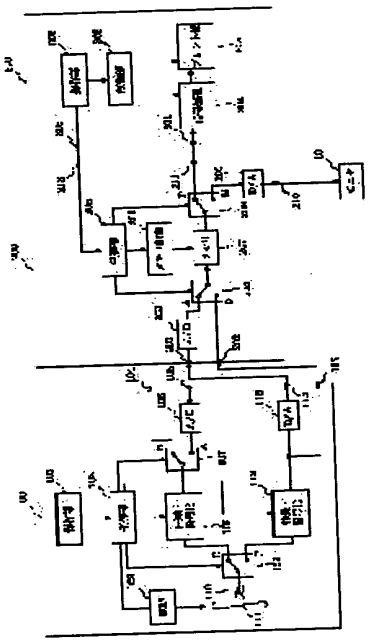
(54) IMAGE FORMING DEVICE AND SYSTEM

(57)Abstract:
PURPOSE: To easily select an image optimum for printing among plural pictures corresponding to stored image signals by storing the image signals equivalent to plural pictures including designated and prescribed pictures.
CONSTITUTION: When the image to actually print is selected among 25 pictures in sample printing, an operator sets a device to a picture selection mode by an operation part 302. The picture of timing which is considered to be most appropriate is selected among 25 pictures, for example, and the number is inputted to the operation part 302 by an input key such as a ten key. When the selection of the printing picture is terminated, the operation part 302 sets the device to a parameter value selection mode. Then, the number of the picture in a desired color is inputted by an input key. Then, the still image of best timing can be extracted among the moving images by the selection, and a desired parameter value can easily be decided. Then, the optimum picture is printed by desired image quality by newly printing the selected image by a printing part 305 based on the decided parameter value.



LEGAL STATUS

[Date of request for examination] 16.02.2001
[Date of sending the examiner's decision of rejection]
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
[Date of final disposal for application]
[Patent number] 3501505

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[Date of registration] 12.12.2003
[Number of appeal against examiner's decision of rejection]
[Date of requesting appeal against examiner's decision of rejection]
[Date of extinction of right]

* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1] A memory means to memorize the dynamic-image signal with which amount of information was compressed to the subject-copy picture signal, A directions means to direct storage of the predetermined screen of said input dynamic-image signal for said memory means, The memory control means which controls said memory means to memorize said dynamic-image signal for two or more screens in a predetermined period including said predetermined screen for said memory means according to the directions from said directions means, Image formation equipment equipped with a record means to record the image according to the dynamic-image signal read from said memory means on a record medium.
[Claim 2] Image formation equipment equipped with an expanding means to elongate the amount of information of the dynamic-image signal memorized by said memory means in equipment according to claim 1.
[Claim 3] Said record means is image formation equipment according to claim 3 characterized by what the image for two or more screens according to the dynamic-image signal outputted from said expanding means is reduced, respectively, and is recorded on said record medium.
[Claim 4] A memory means by which the dynamic-image signal for two or more screens is memorizable, and a processing means to perform predetermined processing to the dynamic-image signal read from said memory means, A record means to record the image according to the dynamic-image signal outputted from said processing means on a record medium, While recording two or more images which embraced the dynamic-image signal for two or more screens memorized by said memory means on the same record medium Image formation equipment equipped with the control means which controls said processing means and said record means to process with different parameter value to said each of two or more images.
[Claim 5] It is image formation equipment equipped with a selection means to choose the parameter which can process said processing means in equipment according to claim 4 using two or more parameters, and is controlled by said control means out of said two or more parameters.

[Claim 6] Said selection means is image formation equipment according to claim 5 characterized by having the function which chooses a desired image out of two or more images recorded on said record medium.
[Claim 7] Said control means is image formation equipment according to claim 6 characterized by controlling said record means and said processing means to record the image according to this picture signal on said record medium after reading further the picture signal according to the image chosen by said selection means from said memory means and processing with the parameter value at the time of said record.
[Claim 8] The dynamic-image signal which should be memorized by said memory means is image formation equipment according to claim 4 characterized by compressing amount of information to a subject-copy picture signal.
[Claim 9] Said parameter is image formation equipment according to claim 5 characterized by including the tint of said image.
[Claim 10] Said parameter is image formation equipment according to claim 5 characterized by

including the concentration of said image.
[Claim 11] The regenerative apparatus which reproduces a dynamic-image signal from a record medium, and a means to input the dynamic-image signal reproduced with said regenerative apparatus, A memory means to memorize said input dynamic-image signal, and a directions means to direct storage of the predetermined screen of said input dynamic-image signal in said memory, The interface device which has the memory control means which controls said memory means to memorize said dynamic-image signal for two or more screens in a predetermined period including said predetermined screen in said memory according to the directions from said directions means, A means to input the dynamic-image signal read from said memory means, and a processing means to perform predetermined processing to the dynamic-image signal read from said memory, While recording the image according to the dynamic-image signal for two or more screens memorized by said memory means on the same record medium The image formation system which consists of image formation equipment which has the control means which controls said processing means and said record means to process with a different parameter to said each of two or more images.
[Claim 12] The dynamic-image signal reproduced with said regenerative apparatus is an image formation system according to claim 11 characterized by compressing amount of information to a subject-copy picture signal.
[Claim 13] It is the image formation system equipped with an expanding means by which said regenerative apparatus elongates the amount of information of said dynamic-image signal in a system according to claim 12, and an output means to output the dynamic-image signal elongated by said expanding means.
[Claim 14] It is the image formation system which said regenerative apparatus is equipped with an output means to output in the condition [that said dynamic-image signal is compressed], in a system according to claim 12, and is characterized by said memory means memorizing a dynamic-image [said being compressed] signal.
[Claim 15] It is the image formation system characterized by having an expanding means to elongate the amount of information of the dynamic-image signal which read said interface device from said memory means in the system according to claim 14, and outputting said elongated dynamic-image signal to said image formation equipment.
[Claim 16] It is the image formation system characterized by having an expanding means to elongate the amount of information of the dynamic-image signal which read said image formation equipment from said memory means in the system according to claim 14, and recording the image according to said elongated dynamic-image signal.
[Claim 17] An input means to input the dynamic-image signal with which amount of information was compressed to the subject-copy picture signal, A memory means to memorize said dynamic-image signal, and a directions means to direct storage of the predetermined screen of said input dynamic-image signal for said memory means, The memory control means which controls said memory means to memorize said dynamic-image signal for two or more screens in a predetermined period including said predetermined screen for said memory means according to the directions from said directions means, The image processing system equipped with an expanding means to elongate the amount of information of the dynamic-image signal read from said memory means, and an output means to output the dynamic-image signal through said expanding means.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] Especially this invention relates to the equipment and the system which form a color picture about image formation equipment and a system.
[0002]
[Description of the Prior Art] Conventionally, the equipment or the system which performs a color-print from dynamic-image information, such as a video signal, is known. The system which color-prints by inputting a dynamic image from VTR as a dynamic-image information regenerative apparatus hereafter using drawing 11 is explained.
[0003] In drawing 11 , the video signal reproduced with VTR1101 is inputted into the input terminal 1104 in a video printer 1102, is outputted to A/D converter 1105 and an output terminal 1108, and is outputted to a monitor 1103 through an output terminal 1108. Checking the playback image displayed on this monitor 1103, an operator operates a control unit 1110 to the timing by which the desired screen was reproduced, and directs the incorporation of an image.
[0004] The control section 1111 which received the image incorporation directions from a control unit 1110 outputs a control signal to the memory control circuit 1109, and memorizes the input video signal for one screen changed into the digital signal by A/D converter 1105 in memory 1106.
[0005] And after storage is completed to the video signal to memory 1106, an operator operates a control unit 1110 further and directs the print of an image.
[0006] The control section 1111 which received directions of the print from a control unit 1110 controls the memory control circuit 1109 and the print section 1112, after it reads the video signal for one screen memorized by memory 1106 and changes it into an analog signal with D/A converter 1107, it outputs them to the print section 1111, and it outputs a color-print in the print section 1111.
[0007]
[Problem(s) to be Solved by the Invention] However, it is very difficult to make the activity of extracting a screen printing in such a video printer out of the video signal which is a dynamic-image signal complete with sufficient timing at a time.
[0008] Moreover, it was difficult for the brightness or color of a screen checked with the monitor to reappear correctly [when actually printed].
[0009] In case this invention extracts a desired screen out of a dynamic image in consideration of said technical problem, while being able to perform an extract easily and correctly, it aims at offering the image formation equipment and the system which can adjust image quality easily by comparing and checking easily the condition of the screen checked on the monitor, and the condition of the screen in an actual print.
[0010]
[Means for Solving the Problem] In order to solve the technical problem currently held conventionally and to attain said purpose, this invention A memory means to memorize the dynamic-image signal with which amount of information was compressed to the subject-copy picture signal, A directions means to direct storage of the predetermined screen of said input

dynamic-image signal for said memory means, The memory control means which controls said memory means to memorize said dynamic-image signal for two or more screens in a predetermined period including said predetermined screen for said memory means according to the directions from said directions means, It has a record means to record the image according to the dynamic-image signal read from said memory means on a record medium, and is constituted.

[0011] Moreover, a memory means by which other invention of this application can memorize the dynamic-image signal for two or more screens, A processing means to perform predetermined processing to the dynamic-image signal read from said memory means, A record means to record the image according to the dynamic-image signal outputted from said processing means on a record medium, While recording two or more images which embraced the dynamic-image signal for two or more screens memorized by said memory means on the same record medium It has the control means which controls said processing means and said record means to process with different parameter value to said each of two or more images, and is constituted.

[0012]

[Function] Since this invention was constituted in this way, it becomes possible easily and to ensure selection actuation of a print image, and adjustment actuation of image quality.

[0013]

[Example] Hereafter, the example of this invention is explained to a detail using a drawing.

[0014] Drawing 1 is the block diagram showing the color picture formation structure of a system as the 1st example of this invention. This example explains the case where digital VTR is used as the input source of a dynamic image.

[0015] The interface section (following I/F section) to set to drawing 1 and for 100 output the playback video signal from VTR100 to the digital VTR which records and reproduces a video signal with a digital signal, and the printer 300 of the after-mentioned [200], and 300 are color printers which print an image. In addition, as long as this printer 300 is color picture formation equipments, such as a color copying machine, what kind of thing is sufficient as it.

[0016] In such a configuration, an operator usually directs playback by the control unit 101 of VTR100 first. A control section 102 will reproduce the digital picture signal which controls the drive circuit 103, conveys a tape 111, and is recorded by the head 110, if these directions of usually playback are received. In addition, although signals other than picture signals, such as a sound signal, are also recorded on the tape 111, only a picture signal is explained here and explanation is omitted about other signals.

[0017] The reproduced digital picture signal is outputted to expanding / decryption circuit 112 through the P side of a switch 109, and expanding processing corresponding to the time of record is performed here, and it is outputted to D/A converter 113 and the analog-to-digital output terminal 115. The picture signal outputted to D/A converter 113 is changed into an analog signal, and is outputted to an analog output terminal 114. The picture signal outputted to the output terminal 114,115 is inputted into the I/F section 200 through the input terminal 201,202 of the I/F section 200, respectively.

[0018] The analog video signal inputted into the analog input terminal 203 is changed into a digital signal by A/D converter 203, and is outputted to a switch 204. A switch 204 switches according to whether the picture signal inputted from VTR100 is an analog signal, or it is a digital signal, and outputs a digital picture signal to memory 207.

[0019] Memory 207 has the capacity for 25 screens with the usual video signal, and the writing of a picture signal and read-out are controlled by the memory control circuit 206. The memory control circuit 206 usually writes the picture signal in memory 207 at the order inputted during playback. And read-out actuation of the picture signal from memory 207 is usually exactly controlled among 25 screens memorized by memory 207 during playback as a monitor output for searching a screen printing to output a central screen, i.e., the screen of order to 13 screen eye, to a switch 208. In addition, although memory 207 was used as the memory in which the writing of ROM etc. and control of the read-out address are possible in this example, it is also possible to use a FIFO memory. In this case, the read-out port is prepared two places and the same actuation as the above-mentioned can be performed by considering as the port to which another

side outputs a picture signal from the location according to the screen of the above-mentioned center in the port which reads the picture signal with which one side was written in the No. 1 beginning.

[0020] The picture signal for monitors outputted from memory 207 is outputted to D/A converter 209 through the M side of a switch 208, and is changed into an analog signal. And it is outputted to a monitor 10 through the output terminal 210 for monitors, and the image according to a playback picture signal is displayed. However, when the input from VTR100 is a digital picture signal, it is also possible to acquire the picture signal for monitors from the analog output terminal of VTR100. Moreover, when an input is an analog picture signal, it is the monitor of digital input correspondence, and it is possible to acquire the picture signal for monitors from the digital output terminal 115 of VTR100. In this case, A/D converter 203 becomes unnecessary.

[0021] Here, an operator operates the control unit 302 of a printer 300, when a desired image is reproduced checking the image displayed on a monitor, and he directs incorporation of an image to the I/F section 200. If the control section 205 of the I/F section 200 has directions of this image incorporation, it will control the memory control circuit 206, and it stops the writing of an image to memory 207. Therefore, in this time, 12 screens of picture signals of the image of a total of 25 screens will be memorized at a time by memory 207 approximately centering on the screen where the operator directed incorporation. In addition, although the picture signal of 25 continuous screens was made to be crowded with this example for memory 207, it is also possible to specify spacing which captures an image as the directions and coincidence of the incorporation of an image by the control unit 302, and to change spacing to write in, such as 1 screen spacing and 2 screen spacing.

[0022] If extract actuation of a screen is completed, an operator will direct the print for parameter setups (following sample print) by the control unit 302. The control section 205 of the I/F section 200 controls the memory control circuit 206 while connecting a switch 208 to the P side, if these directions are received, it reads the picture signal for 25 screens memorized by memory 207 in an order from an old thing, and outputs it to a printer 300 through a switch 208 and an output terminal 211.

[0023] After the digital disposal circuit 305 of a printer 300 performs predetermined processing required for a print to the picture signal outputted from the I/F section 200, it reduces each screen and outputs it to the print section 306. The print section 306 prints the image for 25 screens outputted from the digital disposal circuit 305 five screens of every direction on one sheet of each record form. Moreover, at this time, a digital disposal circuit 305 outputs the picture signal of each screen to the print section 306, while only the specified quantity changes at a time one screen of two kinds of parameters which start signal processing to 25 screens. Before two kinds of this parameter is selectable and performs a sample print in signal processing concerning image quality, such as a tint and concentration (concentration of a color), by the control unit 302 out of two or more parameters which can be adjusted, the operator determines it by operating a control unit 302 beforehand.

[0024] In case it actually prints, it sets one kind of parameter at a time to the axis of ordinate and axis of abscissa in one sheet of print form, respectively, and changes and prints one screen of values of a parameter at a time. In this example, since it prints at a time five screens of each every direction, an axis of ordinate and an axis of abscissa can express the image about five parameter value, respectively. Moreover, in this example, the parameter about a reddish hue is set up as an axis of abscissa, the parameter about the hue of a blue system is set up as an axis of ordinate, and the image to which parameter value was changed in each parameter is printed. That is, the image at the time of shifting a specified quantity [every] tint forward and backward focusing on red (R) in an axis of abscissa is printed, and the image at the time of shifting a specified quantity [every] tint forward and backward focusing on blue (B) in an axis of ordinate is printed. The appearance of this sample print is shown in drawing 2 . Hereafter, the layout of the image shown in drawing 2 and correspondence of the direction of a time-axis of each image are explained using drawing 3 .

[0025] In drawing 3 , the screen of a number 0 is a screen currently displayed on the monitor, when an operator directs incorporation. The every 12 screens picture signal is memorized as

mentioned above by memory 207 centering on this screen of No. 0 approximately. That is, the screen to No. 12 of the direction of time-axis + in drawing 3 and the screen to No. 12 of the direction of - are memorized. And this image from No. -12 to No. +12 is the number shown in each image in drawing 2 .

[0026] Next, selection actuation of the parameter value at the time of printing the image actually printed based on such a sample print and its image is explained.

[0027] First, the actuation in the case of choosing the image which actually prints from 25 screens in a sample print is explained. In this case, an operator makes equipment screen selection mode by the control unit 302. And the screen of timing considered to be the most suitable is chosen from 25 screens, and the number (up to +12--12) is inputted into a control unit 302 by the input key which is not illustrated, such as a ten key.

[0028] If selection of Print Screen is completed, equipment will be made into parameter value selection mode by the control unit 302. And the number of the screen of a desired tint is too inputted by the input key.

[0029] By such a series of selection actuation, while being able to extract the static image of the best timing out of a dynamic image, desired parameter value can be determined easily. And it becomes possible to print the optimal screen by desired image quality by printing a selection image anew based on the parameter value determined in this way.

[0030] Moreover, since the image for different two or more screens in time with which processing was performed with parameter value which is different in one sheet of record form is recorded, it can complete in print actuation of one sheet, selection actuation of a print image, and selection of desired parameter value, i.e., image quality adjustment, and reduction of a print form is also attained.

[0031] In addition, according to the adjustment width of face of the parameter which did not necessarily need to be the same although the sample print was in every direction and screen number of sheets was made the same in this example, and was chosen, it can change suitably. for example, the thing for which an axis of abscissa is made into seven screen display as a parameter of an axis of abscissa and an axis of ordinate like drawing 2 in order to expand the width of face of reddish tint adjustment when the tint of reddish and a blue system is taken, respectively and the direction of a reddish tint needs more delicate adjustment -- being possible . In this case, it is realizable in the same actuation as the above-mentioned case by increasing the capacity of memory 207 and carrying out storage possible [of the image for 5= 7x35 screen]. However, if the number of screens increases, it is necessary to change the magnitude of one screen according to the number of screens.

[0032] Here, the actuation at the time of record and playback of VTR100 in this example, compression / coding actuation, and expanding / decryption actuation are explained.

[0033] First, in record, the digital picture signal inputted from the picture signal or the digital input terminal 104 which inputted from the analog input terminal 105 and was changed into the digital signal by A/D converter 106 is outputted to compression and a coding network 108 through a switch 107. And the picture signal with which amount of information was compressed by this compression and coding network 108 is outputted to a head 110 through R terminal of a switch 109, and is recorded on a tape 111.

[0034] It is as [actuation / at the time of playback] above-mentioned.

[0035] In this example, actuation of compression, a coding network 108, and expanding / decryption circuit 112 performs coding and the decryption which were adapted for MPEG (Moving Picture coding Expert Group). Hereafter, coding and the decryption in this MPEG are explained.

[0036] This MPEG data is international standards aiming at performing high efficiency coding of a dynamic image, and while using the frequency characteristics of data, and human being's vision property, high efficiency coding of it is carried out using the redundancy of the direction of a time-axis.

[0037] Namely, although an MPEG method has MPEG1 which set the transfer rate to a maximum of 1.5 Mbps for digital storage media, and MPEG 2 which planned to abolish the upper limit of a transmission rate and to be used by all transmission systems, such as a bidirectional digital

multimedia device, digital VTR, ATV, and an optical fiber network, since the fundamental algorithm is almost the same, it explains the algorithm of the DS, and coding and a decryption by using MPEG1 as the base.
[0038] In addition, although two or more profiles (a simple profile, the Maine profile, scalable one, space scalable, yes) have prescribed the usable coding approach in MPEG 2, the typical Maine profile is the same as that of MPEG1 almost fundamentally.
[0039] First, the principle of the low bit rate coding method by this MPEG is explained.
[0040] the difference which dropped the redundancy of time amount shaft orientations on taking inter-frame difference in this low bit rate coding method, and was obtained by this -- high efficiency coding is realized for data as a whole DCT and by carrying out variable-length-coding processing and dropping the redundancy of the direction of space.
[0041] About the redundancy of said direction of a time-axis, it becomes possible to drop redundancy on the frame and time amount target which correlation of the frame which continued in the case of the animation tends to encode paying attention to a high thing by taking difference with precedence or the frame which carries out backward.
[0042] then, the intra obtained in the agreement-ized mode chiefly encoded within a frame in MPEG as shown in drawing 4 -- besides a coded image (I-picture) difference with the frame preceded in time -- with the forward prediction coded image (P-picture) which encodes a value It has the both-directions predicting-coding image (B-picture) which encodes among values what has the fewest amount of data. difference with the frame preceded in time or the frame which carries out backward -- difference with the interpolation frame from a value or both [these] frames -- Each frame by these agreement-ized modes is combined in predetermined sequence.
[0043] In MPEG, I-picture, above-mentioned P-picture, and above-mentioned B-picture are made into one unit (GOP:Group Of Pictures) on one screen, four screens, and ten screens, respectively. The combination which allots I-picture to a head, and repeats and allots B-picture of two sheets and P-picture is recommended. While making possible partial regeneration which made the unit special playback of reverse playback etc., and this GOP by placing I-picture a fixed period, prevention of error propagation is aimed at.
[0044] in addition, the direction which took difference with the frame which carries out backward when a new body appears in a frame, rather than it takes difference with the frame preceded in time -- the difference -- a value may decrease
[0045] then, the both-directions predicting coding above in MPEG -- carrying out -- more -- high -- efficiency compression is performed.
[0046] Moreover, a motion compensation is performed in MPEG.
[0047] That is, difference with precedence or the macro block near the correspondence block of a backward frame is taken per predetermined block (macro block) which collected [data / brightness] 2 blocks of blocks of an input image of 8 pixel x8 pixel about 4 blocks and color difference data, by searching for the macro block with few differences, a motion vector is detected and this motion vector is encoded as data.
[0048] In the case of decode, the correspondence macro block data of precedence or a backward frame is extracted using this motion vector, and the coded data encoded by this using the motion compensation is decoded.
[0049] Once encoding the frame preceded in time on the occasion of such a motion compensation, the frame decoded again is obtained, it considers as a precedence frame, and a motion compensation is performed using the macro block in this frame, and the macro block of the frame which it is going to encode.
[0050] In addition, although MPEG1 performs an inter-frame motion compensation, the motion compensation between the fields is performed in MPEG 2.
[0051] the difference obtained by the above motion compensations -- high efficiency coding of data and the motion vector is further carried out by a discrete cosine transform (Discrete Cosine Transformation: henceforth, DCT), quantization, and variable length coding.
[0052] Next, the DS of this MPEG method is explained.
[0053] This DS consists of layered structures which consist of a video sequence layer, a GOP

layer, a picture layer, a slice layer, a macro block layer, and a block layer as shown in drawing 5 .
[0054] Hereafter, each class is explained sequentially from drawing Nakashita's layer.
[0055] First, a block layer consists of 8 pixel x8 pixels respectively for every brightness data and color difference data, and DCT is performed for every unit of this.
[0056] A macro block layer packs [data / brightness] each 1 block of blocks of 8 pixel x8 pixel mentioned above about 4 blocks and color difference data, attaches a macro block header, and makes it the motion compensation which mentions this macro block later, and the unit of coding by the MPEG method. Moreover, a macro block header is each data of the motion compensation of each macro block unit, and a quantization step, and 6DCT block within each macro block (Y0, Y1, Y2, Y3, Cr, Cb). The data of whether to have data are included.
[0057] Said slice layer consists of one or more macro blocks and slice headers which stand in a row in order of the scan of an image, and can set constant the quantization step in a series of macro blocks in the same slice layer. In addition, said slice header has data about the quantization step in each slice layer, and when there are no quantization step data of a proper in each macro block, it sets constant the quantization step in the slice layer. moreover, a top macro block -- the difference of a dc component -- a value is reset.
[0058] A picture layer collects two or more above-mentioned slice layers per one frame, and consists of a header which consists of a picture start code etc., and one or more slice layers following this. This header contains the code which shows the coding mode of an image, and the code which shows the precision (are they a pixel unit or a half-pixel unit?) of motion detection.
[0059] A GOP layer consists of headers, such as a time code which shows the time amount from the beginning of a group start code or a sequence, two or more I following this, B frames, or P frames.
[0060] A video sequence layer begins from a sequence start code, and is ended by the sequence end code, and two or more GOP(s) with same control data required for decode of image size, an aspect ratio, etc. between them, image size, etc. are arranged.
[0061] As for the MPEG method with such DS, the bit stream is prescribed by the specification.
[0062] Next, the configuration of the compression and the coding network 108 treating the above MPEG data, and expanding / decryption circuit 112 is explained using drawing 6 and drawing 7 .
[0063] First, compression and a coding network 108 are explained. Drawing 6 is the block diagram showing the configuration of compression and a coding network 108. As shown in drawing 6 , the outline configuration of compression and the coding network 108 is carried out from the blocking circuit 601, the DCT circuit 603, the quantization (Quantization:Q) circuit 604, the variable-length-coding (Variable Length Coding:VLC) circuit 304, the motion compensation circuit 305, the motion vector detector 306, the rate control circuit 307, the local decoder circuit 308, and the output-buffer 309 grade.
[0064] As shown in drawing 8 , the image size made into the object of coding in this example Moreover, 1920 pixel x1080 pixel High (it corresponds to the high level in MPEG 2), 1440 pixel x1080 pixel High1440 (it corresponds to high 1440 level in MPEG 2), 4:2:2 or 4:2:0 images (it corresponds to the Maine level in MPEG 2) corresponding to CCIR.601, There are SIF, CIF, and a thing corresponding to a QCIF format, and image size of said SIF format is targetted in the low level of MPEG1 and MPEG 2.
[0065] In drawing 6 , the image data inputted from the switch 107 in drawing 1 is considered as the above-mentioned block of 8 pixel x8 pixel in the blocking circuit 601, and is transmitted to the DCT circuit 603 through a switch 602.
[0066] said switch 602 -- input image data -- intra -- what is switched by whether they are a frame (I frames) or the other frame (P frames or B frames) -- it is -- intra -- in the case of a frame, it connects at an a-contact, and when other, it connects with a b contact.
[0067] intra -- in the case of a frame, DCT is carried out in the DCT circuit 302, it is changed into the data of a frequency domain from the data of a space field, and the DCT multiplier obtained by this is quantized in the quantization circuit 604. And after variable length coding is carried out by the variable-length coding network 605, a buffer 606 once memorizes.
[0068] on the other hand -- intra -- in other than a frame, the motion compensation which the switch 602 was connected to Contact b and explained previously is performed. That is, 613,614

is the reverse quantization circuit and reverse DCT circuit which constitute the local decoder 612, and the data quantized in the quantization circuit 604 are returned to the original image by this local decoder circuit 612.
[0069] 611 [moreover,] -- an adder and 610 -- intra -- the switch with which it is closed only in other than a frame, and 611 are subtractors, and the image data by which local decode was carried out outputs the correspondence macro block in a predetermined frame (a precedence frame, backward frames, or these interpolation frames) with reference to the motion vector detected in the motion vector detector 616.
[0070] subtraction processing of the output of this motion compensation circuit 615 is carried out with input image data with a subtractor 609 -- having -- difference -- a value obtains -- having -- this difference -- it encodes by the DCT circuit 603, the above-mentioned quantization circuit 604, and the above-mentioned variable-length coding network 605, and a value is memorized by the buffer 606.
[0071] In addition, the motion vector detector 616 performs the comparison with the frame data to be encoded from now on and predetermined reference frame data, and obtains a motion vector, and the detection output of this detector 616 specifies the macro block which the motion compensation circuit 615 is supplied and the motion compensation circuit 615 should output. Moreover, the rate control circuit 607 performs the amount control of signs by switching the quantization step in the quantization circuit 604 based on the occupation of the coded data in a buffer 606.
[0072] Various headers as finally shown previously in the addition circuit 608 are added to coded data, and it sends out as MPEG data corresponding to an MPEG method.
[0073] On the other hand, fundamentally, expanding / decryption circuit 112 performs reverse actuation of above-mentioned compression and coding, and as shown in drawing 7 , it consists of an input buffer 701, the variable-length decryption (Variable Length Decoding:VLD) circuit 702, reverse quantization (Inverse Quantization:IQ) 703 circuit, a reverse DCT (: IDCT) circuit 704, a motion compensation circuit 705, and output-buffer 706 grade.
[0074] That is, a head 110 is reproduced and the coded-image data inputted through the switch 109 are memorized by the input buffer 701. And the coded data read from the input buffer 701 is changed into the data of a space field according to the data before coding by the variable-length decryption circuit 702, the reverse quantization circuit 703, and the reverse DCT circuit 704.
[0075] moreover, the difference by which 707 is outputted to an output from the motion compensation circuit 705 from the reverse DCT circuit 704 -- it is an adder for adding a value and 708 is a switch for choosing the output of the reverse DCT circuit 704, or the output of an adder 707. the coding mode information that this switch 708 was detected by the non-illustrated data detector -- being based -- switching -- intra -- in the case of a frame, it connects with the a side, and when other, it connects with the b side.
[0076] Thus, the decoded data are once memorized by the output buffer 706, are further returned to the original pixel arrangement, and are outputted to D/A converter 113 and the digital output terminal 114.
[0077] As explained above, according to this example, it becomes possible by crowding the picture signal for two or more screens for memory centering on one desired screen, changing a parameter, respectively and printing the image of these plurality on one sheet of record form to be able to extract the optimal image easily, when printing the image of one sheet out of a dynamic image, and to perform desired image quality adjustment with 1 time of a sample print.
[0078] In the above-mentioned example, although it was outputting to the I/F section 200 after decoding the image reproduced with VTR100, it is also possible to lessen capacity of memory by outputting to the I/F section 200, while the image compressed and encoded as mentioned above had been compressed. The case where being compressed in this way playback image data is hereafter outputted and printed on the I/F section 200 as the 2nd example of this invention is explained.
[0079] Drawing 9 is the block diagram showing the image formation structure of a system as the 2nd example of this invention. In addition, the same number is attached about the same component as the above-mentioned example, and the detailed explanation is omitted.

[0080] In drawing 9 , the picture signal reproduced by the head 110 like the above-mentioned example is outputted also to an output terminal 116 while it is outputted to expanding / decryption circuit 112. And in this example, data [compression and encoding] are outputted through this output terminal 116 to the I/F section 200.
[0081] In addition, the image data which met the MPEG method as mentioned above and was decoded in expanding / decryption circuit 112 is changed into an analog signal by D/A converter 113, it is outputted to a monitor 10 through an analog output terminal 114, and the image according to a playback image is displayed. Thus, in this example, the picture signal outputted from an analog output terminal 114 is made into the picture signal for monitors.
[0082] The picture signal outputted from the output terminal 116 is inputted into memory 207 through the input terminal 213 for compressed data of the I/F section 200. In this example, since the picture signal inputted to memory 207 is data [being compressed], it can lessen the capacity overwhelmingly compared with the above-mentioned example.
[0083] Thus, if an image is reproduced with VTR100, an operator will operate the control unit 302 of a printer 300, when a screen [checking a monitor] to print is reproduced. Then, the control section 205 of the I/F section 200 controls the memory control circuit 206 like the above-mentioned, and stops the writing of a picture signal to memory 207. Also in this example, the picture signal for 25 screens centering on the screen at the time of there being directions of image incorporation is memorized by memory 207.
[0084] In this example, expanding / decryption circuit 214 is established also in the I/F section 200, and this expanding / decryption circuit 214 performs the same actuation as the expanding decryption circuit 112 in VTR100. That is, after the incorporation of the picture signal to memory 207 is completed, an operator chooses two kinds of above-mentioned parameters in a sample print while directing a sample print by the control unit 302. If there are directions of this sample print, a control section 205 reads a compression picture signal from memory 207, performs decode processing of the above coded data by expanding / decryption circuit 214, and after returning to the image data of a basis, it will output it to a printer 300 through an output terminal 211.
[0085] About print actuation of the following sample prints and a selection image, it is the same as that of the above-mentioned example.
[0086] As explained above, according to this example, it becomes possible by establishing expanding / decryption circuit 214 also in the I/F section 200 to decrease the capacity of the memory 207 of the I/F section 200 sharply.
[0087] Moreover, the transmission rate between VTR100 and I/F200 can be made low, and it becomes possible to mitigate the burden of the I/F section 200 including expanding / decryption circuit 214.
[0088] Furthermore, also in which the above-mentioned example, since memory or expanding / decryption circuit is established in the I/F section 200, it is possible to print an image from a dynamic-image signal also by the printer without these equipment.
[0089] Next, the 3rd example of this invention is explained. This example has established memory and expanding / decryption circuit in the interior of a printer 300.
[0090] Drawing 10 is the block diagram showing the image formation structure of a system as the 3rd example of this invention.
[0091] In drawing 10 , the compression picture signal outputted from the output terminal 116 of VTR100 is inputted into memory 309 through an input terminal 307. Memory 309 is the same memory as the 2nd above-mentioned example, and can memorize the compression picture signal for 25 screens.
[0092] An operator operates a control unit 302, when a screen to check and print the playback image displayed on a monitor is reproduced, and he performs incorporation directions of an image. If a control section 303 has directions of image incorporation, it will control the memory control circuit 308 and will stop the writing of a picture signal like the above-mentioned example.

[0093] Also in this example, expanding / decryption circuit 310 carries out the same actuation as expanding / decryption circuit 112 of VTR100. That is, after the incorporation of the picture

signal to memory 309 is completed, an operator chooses two kinds of above-mentioned parameters in a sample print while directing a sample print by the control unit 302. If there are directions of this sample print, a control section 303 reads a compression picture signal from memory 309, performs decode processing of the above coded data by expanding / decryption circuit 310, and after returning to the image data of a basis, it will output it to a digital disposal circuit 304.

[0094] About the actuation which performs predetermined processing by the digital disposal circuit 304, and is hereafter printed in the print section 305, it is the same as that of the above-mentioned example.

[0095] By this example, as explained above, since memory and expanding / decryption circuit were established in the body of a printer, through the I/F section, the playback image from VTR100 can be inputted as it is, and can be printed. Therefore, it becomes possible to miniaturize a system-wide scale.

[0096] In addition, in the 3rd above-mentioned example, expanding / decryption circuit is established in the I/F section 200 and a printer 300, and although considered as the configuration which inputs a picture signal [being compressed] from VTR100, the decoded picture signal may be constituted possible [an input] like the 1st example.

[0097] Moreover, although the above-mentioned example explained the case where a desired image was printed from the dynamic-image signal reproduced by digital VTR, you may be the image photoed with the image reproduced not only from this but from other record media, a picture signal, a video camera which were received by the electric wave etc., etc.

[0098]

[Effect of the Invention] Since the picture signal for two or more screens including the directed predetermined screen is memorized in memory and the image for two or more screens according to this memorized picture signal is recorded on a record medium, by this invention, the optimal image for a print can be easily chosen from dynamic images, so that clearly from the above explanation.

[0099] Moreover, since the image for two or more screens which processed with parameter value different, respectively in other invention of this application is recorded on the same record medium, it becomes possible to adjust image quality easily by being able to check easily the image actually printed with different parameter value, and choosing the image processed with desired parameter value.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram showing the image formation structure of a system as the 1st example of this invention.
[Drawing 2] It is drawing showing the appearance of the sample print in the example of this invention.
[Drawing 3] It is drawing for explaining correspondence with the image in the memory in the example of this invention, and a print image.
[Drawing 4] It is drawing for explaining compression / expanding actuation in the example of this invention.
[Drawing 5] It is drawing for explaining compression / expanding actuation in the example of this invention.
[Drawing 6] It is the block diagram showing the configuration of the compression and the coding network in the example of this invention.
[Drawing 7] It is the block diagram showing the configuration of expanding / decryption circuit in the example of this invention.
[Drawing 8] It is drawing for explaining the handling data in the example of this invention.
[Drawing 9] It is the block diagram showing the image formation structure of a system as the 2nd example of this invention.
[Drawing 10] It is the block diagram showing the image formation structure of a system as the 3rd example of this invention.
[Drawing 11] It is the block diagram showing the conventional example.
[Description of Notations]
100 Digital VTR
108 Compression and Coding Network
112 Expanding / Decryption Circuit
200 Interface Section
206 Memory Control Circuit
207 Memory
300 Printer
304 Digital Disposal Circuit

[Translation done.]

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CORRECTION OR AMENDMENT

[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law
[Section partition] The 3rd partition of the 7th section
[Publication date] November 2, Heisei 13 (2001. 11.2)

[Publication No.] JP,8-46901,A
[Date of Publication] February 16, Heisei 8 (1996. 2.16)
[Annual volume number] Open patent official report 8-470
[Application number] Japanese Patent Application No. 6-175383
[The 7th edition of International Patent Classification]

H04N 5/76
5/92
7/24

[FI]

H04N 5/76 E
5/92 Z
7/13 Z

[Procedure revision]
[Filing Date] February 16, Heisei 13 (2001. 2.16)
[Procedure amendment 1]
[Document to be Amended] Specification
[Item(s) to be Amended] The name of invention
[Method of Amendment] Modification
[Proposed Amendment]
[Title of the Invention] Image formation equipment and an image processing system
[Procedure amendment 2]
[Document to be Amended] Specification
[Item(s) to be Amended] Claim
[Method of Amendment] Modification
[Proposed Amendment]
[Claim(s)]
[Claim 1] An input means to input the dynamic-image signal with which amount of information was compressed to the subject-copy picture signal,
Memory means,
A directions means to direct storage of the screen of the request in said dynamic-image signal to said memory means,
The memory control means which controls said memory means to memorize the dynamic-image signal for two or more screens in a predetermined period including the screen of said request in

said dynamic-image signal according to the directions from said directions means,
Image formation equipment equipped with a record means to record two or more images which embraced the dynamic-image signal for two or more screens memorized by said memory means on one record medium.
[Claim 2] Image formation equipment according to claim 1 characterized by having an expanding means to elongate the amount of information of the dynamic-image signal read from said memory means.
[Claim 3] Said record means is image formation equipment according to claim 2 characterized by what the image of two or more screens according to the dynamic-image signal for said two or more screens outputted from said expanding means is reduced, respectively, and is recorded on said record medium.
[Claim 4] An input means to input a dynamic-image signal,
Memory means,
A directions means to direct storage of the screen of the request in the dynamic-image signal inputted by said input means to said memory means,
The image processing system equipped with the memory control means which controls said memory means to memorize the dynamic-image signal for two or more screens of a predetermined period including the screen of said request in the dynamic-image signal inputted by said input means, and the screen before and behind that according to the directions from said directions means.
[Claim 5] The dynamic-image signal inputted from said input means is an image processing system according to claim 4 characterized by compressing amount of information.
[Claim 6] Said dynamic-image signal is an image processing system according to claim 5 characterized by compressing amount of information according to an MPEG method.
[Claim 7] Said memory control means is an image processing system according to claim 4 characterized by controlling said memory means to memorize the dynamic-image signal of said continuous two or more screens.
[Claim 8] It is the image processing system according to claim 4 which is equipped with a setting means set up spacing which incorporates the dynamic-image signal of said two or more screens from the dynamic-image signal inputted from said input means, and is characterized by for said memory control means to control said memory means to incorporate and memorize the dynamic-image signal of said two or more screens from the dynamic-image signal inputted from said input means at spacing set up by said setting means.
[Procedure amendment 3]
[Document to be Amended] Specification
[Item(s) to be Amended] 0001
[Method of Amendment] Modification
[Proposed Amendment]
[0001]
[Industrial Application] This invention relates to image formation equipment and an image processing system.
[Procedure amendment 4]
[Document to be Amended] Specification
[Item(s) to be Amended] 0009
[Method of Amendment] Modification
[Proposed Amendment]
[0009] In case this invention extracts a desired screen out of a dynamic image in consideration of said technical problem, it aims at offering the equipment which can perform an extract easily and correctly.
[Procedure amendment 5]
[Document to be Amended] Specification
[Item(s) to be Amended] 0010
[Method of Amendment] Modification
[Proposed Amendment]

[0010]
[Means for Solving the Problem] This invention is constituted by the following, in order to solve the technical problem currently held conventionally and to attain said purpose. An input means to input the dynamic-image signal with which amount of information was compressed to the subject-copy picture signal Memory means A directions means to direct storage of the screen of the request in said dynamic-image signal to said memory means The memory control means which controls said memory means to memorize the dynamic-image signal for two or more screens in a predetermined period including the screen of said request in said dynamic-image signal according to the directions from said directions means, and a record means to record two or more images which embraced the dynamic-image signal for two or more screens memorized by said memory means on one record medium
[Procedure amendment 6]
[Document to be Amended] Specification
[Item(s) to be Amended] 0011
[Method of Amendment] Modification
[Proposed Amendment]
[0011] Moreover, an input means by which other invention of this application inputs a dynamic-image signal and a memory means, A directions means to direct storage of the screen of the request in the dynamic-image signal inputted by said input means to said memory means, It has the memory control means which controls said memory means to memorize the dynamic-image signal for two or more screens of a predetermined period including the screen of said request in the dynamic-image signal inputted by said input means, and the screen before and behind that according to the directions from said directions means, and is constituted.
[Procedure amendment 7]
[Document to be Amended] Specification
[Item(s) to be Amended] 0012
[Method of Amendment] Modification
[Proposed Amendment]
[0012]
[Function] Since this invention was constituted in this way, selection actuation of a print image can be ensured [easily and].
[Procedure amendment 8]
[Document to be Amended] Specification
[Item(s) to be Amended] 0098
[Method of Amendment] Modification
[Proposed Amendment]
[0098]
[Effect of the Invention] Since the dynamic-image signal of two or more screens of a predetermined period including the screen of the directed request is memorized according to this invention so that clearly from the above explanation, a desired screen can be easily chosen out of a dynamic-image signal.
[Procedure amendment 9]
[Document to be Amended] Specification
[Item(s) to be Amended] 0099
[Method of Amendment] Deletion

[Translation done.]